

Listing of Claims

The following listing of claims will replace all prior versions, and listings, of claims in the subject application:

1. (original) A phase-change optical recording medium capable of carrying out record/ readout/ erase operations of information data through the reversible phase transition between amorphous and crystalline states induced by light beam irradiation in a recording layer included in said recording medium, comprising:

a transparent substrate on which the light beam is incident; and

contiguous layers formed on said substrate in order as follows, a lower dielectric protective layer, said recording layer, an upper dielectric protective layer, and a reflective/ heat dissipating layer; wherein

said upper dielectric protective layer essentially consists of a mixture of ZrO_2 and SiO_2 , having a composition of $(ZrO_2)_{100-x} (SiO_2)_x$, where $0 < x < 60$ (mole %).

2. (original) The phase-change optical recording medium according to claim 1,

wherein said upper dielectric protective layer has a thermal conductivity of at most 2W/ mK.

3. (original) The phase-change optical recording medium according to claim 1,

wherein said reflective/ heat dissipating layer

essentially consists of a material selected from the group consisting of Ag and Ag alloys.

4. (original) The phase-change optical recording medium according to claim 1,

wherein said recording layer essentially consists of Sb and Te, as major ingredients, further consisting of at least three kinds of elements selected from a group consisting of Ag, In, Ge and Ga, having a composition of $X_\alpha Sb_\beta Te_{100-\alpha-\beta}$, with X being at least three kinds of elements above mentioned, where $0 < \alpha < 15$, and $65 < \beta < 80$ (atom %).

5. (original) The phase-change optical recording medium according to claim 1,

wherein said recording medium is operable at a linear velocity of equal to, or larger than 7 m/sec during recording.

6. (original) A phase-change optical recording medium capable of suitably carrying out record/ readout/ erase operations of information data through the reversible phase transition between amorphous and crystalline states induced by light beam irradiation in a recording layer included in said recording medium, comprising:

a transparent substrate on which the light beam is incident; and

contiguous layers formed on said substrate in order as follows, a lower dielectric protective layer, said recording

layer, a first upper dielectric protective layer, a second upper dielectric protective layer, and a reflective/ heat dissipating layer; wherein

said first upper dielectric protective layer
essentially consisting of a mixture of ZnS, ZrO₂ and SiO₂,
having a composition of (ZnS)_x (ZrO₂)_y (SiO₂)_{100-x-y}, where 30 <
x < 70 and 30 < y < 70 (mole %).

7. (original) The phase-change optical recording medium according to claim 6,

wherein said second upper dielectric protective layer
essentially consists of SiC.

8. (original) The phase-change optical recording medium according to claim 6,

wherein said first upper dielectric protective layer
has a thermal conductivity of at most 2W/ mK.

9. (original) The phase-change optical recording medium according to claim 6,

wherein said recording layer essentially consists of Sb and Te, as major ingredients, further consisting of at least two kinds of elements selected from a group consisting of Ag, In and Ge, having a composition of X_α Sb_β Te_{100-α-β}, with X being at least two kinds of elements above mentioned, where 0 < α < 15, and 60 < β < 80 (atom %).

10. (original) The phase-change optical recording

medium according to claim 6,

wherein said reflective/ heat dissipating layer
essentially consists of a material selected from the group
consisting of Ag and Ag alloys.

11. (original) The phase-change optical recording
medium according to claim 6,

wherein said recording medium is operable at a linear
velocity of equal to, or larger than 7 m/sec during
recording.

12. (original) A phase-change optical recording
medium, comprising:

a reflective/ heat dissipating layer provided
contiguously to at least one surface of a recording layer,
having a dielectric protective layer interposed between said
reflective/ heat dissipating layer and said recording layer;

wherein said recording layer essentially consists of a
phase-change recording material having a Sb_xTe meta-stable
phase, said dielectric protective layer essentially consists
of a dielectric material containing ZrO₂ as a major
ingredient, and said reflective/ heat dissipating layer
essentially consists of Ag, as a major ingredient.

13. (original) The phase-change optical recording
medium according to claim 12,

wherein said dielectric material, which contains ZrO₂ as
a major ingredient, is stabilized zirconia.

14. (original) The phase-change optical recording medium according to claim 12,

wherein said dielectric material containing ZrO_2 as a major ingredient is selected from the group consisting of:

- (i) $(ZrO_2)_{100-x} (CrO_2)_x$, where $0 \leq x \leq 50$ (mole %),
- (ii) $(ZrO_2)_{100-x} (Nb_2O_5)_x$, where $0 \leq x \leq 30$ (mole %),
- (iii) $(ZrO_2)_{100-x} (REO)_x$, where RE designates rare earth, and where $0 \leq x \leq 20$ (mole %),
- (iv) $(ZrO_2)_{100-x} (MgO)_x$, where $0 \leq x \leq 20$ (mole %),
- (v) $(ZrO_2)_{100-x} (CaO)_x$, where $0 \leq x \leq 20$ (mole %),
- (vi) $(ZrO_2)_{100-x} (Y_2O_3)_x$, where $0 \leq x \leq 20$ (mole %), and
- (vii) $(ZrO_2)_{100-x} (TiO_2)_x$, where $0 \leq x \leq 20$ (mole %).

15. (original) The phase-change optical recording medium according to claim 12,

wherein said reflective/ heat dissipating layer essentially consisting of Ag-Cu alloys having a compositional ratio of $0.1 \leq Cu/Ag \leq 10$ (mole ratio).

16. (currently amended) The phase-change optical recording medium according to claim 12,

wherein said recording layer is formed to be interposed between said dielectric protective layers each essentially consisting of said dielectric material, which contains ZrO_2 as a major ingredient, ~~of anyone of claims II-3 and II-4.~~